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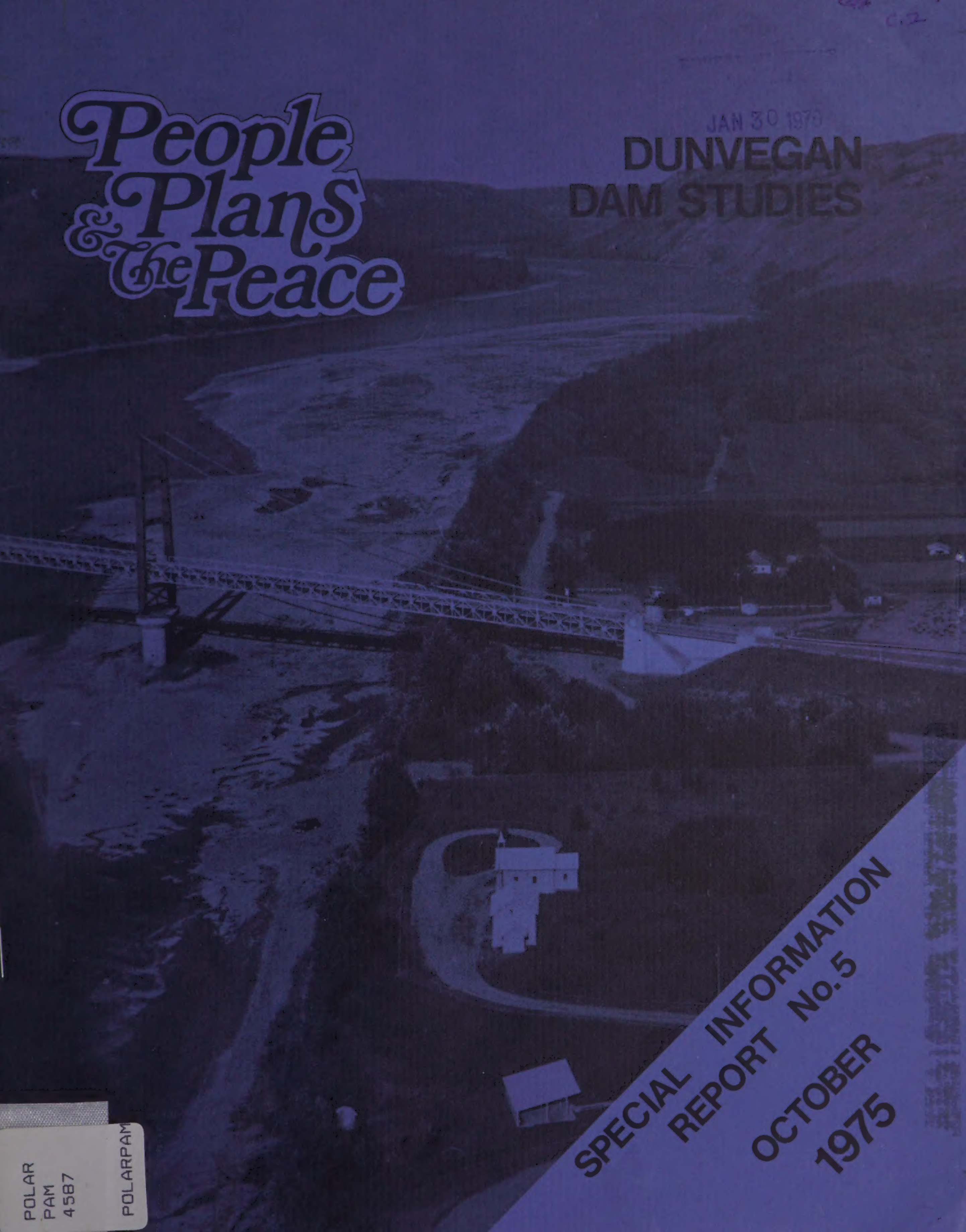

People Plans & The Peace

DUNVEGAN DAM STUDIES

SPECIAL INFORMATION REPORT No. 5

OCTOBER 1975

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A DAM AT DUNVEGAN?

About this report...

The Peace River Regional Planning Commission's Dunvegan Dam Review Committee feels it would be useful to present this information at the present time for several reasons.

The Review Committee, from its inception in March 1975, has been steadily accumulating basic information on the Dunvegan Dam Studies, and at the same time gaining a greater awareness of the many uses surrounding hydro-electric developments in general. The Committee believes that it should more directly share this information and awareness with other people in the region before the consultants finalize their reports on the studies. The report is also in line with the Committee's agreed upon program of action.

With the information in this report it is hoped that people in the region will be able to participate in a more informed and meaningful way in the decision-making on this issue. The Review Committee exists as a means of channeling your participation and invites you to let them know your views. Then the Committee can pass these on to the government and its consultants, and hence your views would find their way into the reports on the studies.

Release of the information report now is particularly timely in view of the initiative of the Fairview and District Chamber of Commerce to sponsor a regional public forum on the issue, and also in view of the coming "Opportunity North" conference. The Committee hopes this report will be especially useful to those people attending these important events.

Further information reports and regular news releases may be expected from the Review Committee while the Dunvegan Dam issue is alive.

The report stresses graphic presentation of information, with maps and diagrams and photographs. The items of supporting text provide an introduction to the issue, some historical background, an elaboration of some of the engineering issues and study alternatives, and some information on hydro developments on the B.C. stretch of the Peace River. It had been hoped to include some articles intended to promote constructive discussion of the larger perspective of water resources development but these have been held back until a future occasion

This report complements an information package prepared by the Environmental Planning Division, Alberta Environment (dated September 1975) on behalf of the provincial government's Ad Hoc Management Committee monitoring the Dunvegan Dam Studies. The government information package contains information on the terms of reference of the consultants conducting the studies, the planning process to be followed, and diagrams showing the progress, schedule and organization of the studies. The information package is available by writing to the Director, Environmental Planning Division, 100th Avenue Building, Alberta Environment, Edmonton.

The above government report should be clearly distinguished from the present report which is issued by the Dunvegan Dam Review Committee of the Peace River Regional Planning Commission. The present report has been assembled and coordinated by Ian Wight on behalf of the members of the Dunvegan Dam Review Committee. Mr. Wight is Senior Research Planner at the Commission, Secretary to the Review Committee, and the Commission's representative on the provincial government's Ad Hoc Management Committee on the Dunvegan Damsite. Some of the information presented in this report was gained from Mr. Wight's contact with the Ad Hoc Management Committee. The report coordinator would also like to acknowledge the assistance of the following: Public Relations Division, B.C. Hydro; Conrad Boyce (editing); Tim Rhodes (layout and graphics); Pat MacAlister (typing); and Bruce Gordon, publisher of the Fairview Post, for provision of the photograph which forms the basis of the artistic view diagram.

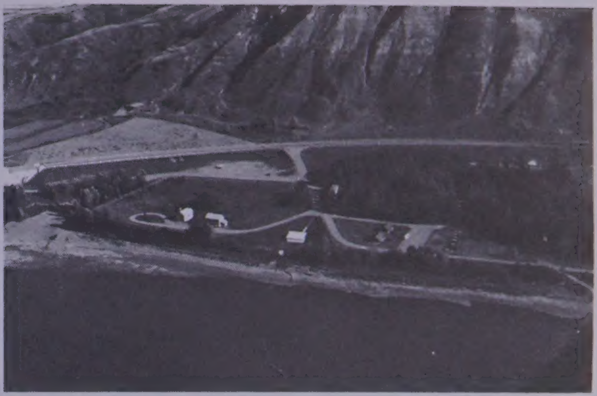
Despite the contributions mentioned above, final responsibility for the contents of this report, and in particular any judgements or opinions expressed in it, rests with the report coordinator. It should be stressed that the government Ad Hoc Management Committee can in no way be associated with this report or be held responsible for any of its contents.

Your comments would be valued and the Review Committee welcomes any requests you may have for further information.

The Information Paper Series and its role in the Planning Process

This paper on the Dunvegan Dam Studies is one of a series currently being produced by the Commission.

"The purpose of the series is, through the Commission membership, to present information to the residents of the region on matters which may affect their future well-being. The object of the individual papers is to generate a high level of informed public discussion on these matters with a view to determining the need for actions of a planning nature. Because of this no explicit planning recommendations are made by Commission staff in the information papers. Instead it is hoped that the region's public, individually or collectively, will take the information, evaluate it on the basis of their own feelings and experiences, and from it generate their own courses of action and planning recommendations. Such recommendations may then be directed to the Commission and other public authorities in the region. In some cases it may be anticipated that the recommendations will necessitate substantially more research than was embodied in the information paper. In this way a major research report can be undertaken, such as those done in the past on central places in the region, the economic base, outdoor recreation and tourism, and the goals and objectives of the region's residents. Staff planning or policy recommendations would form a part of such a report to the extent of responding to the requests that led to the initiation of the major study."



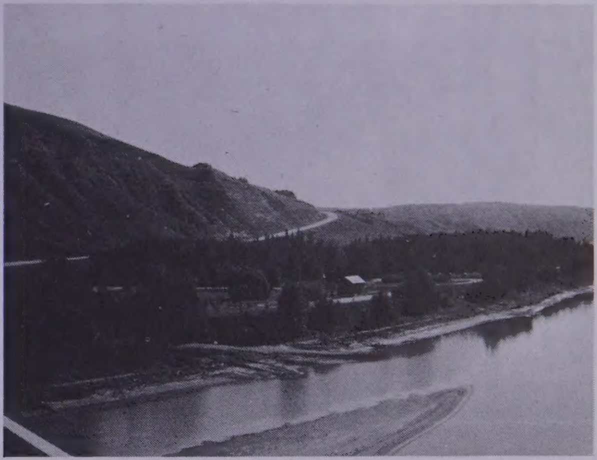
From the air

DUNVEGAN HISTORIC SITE

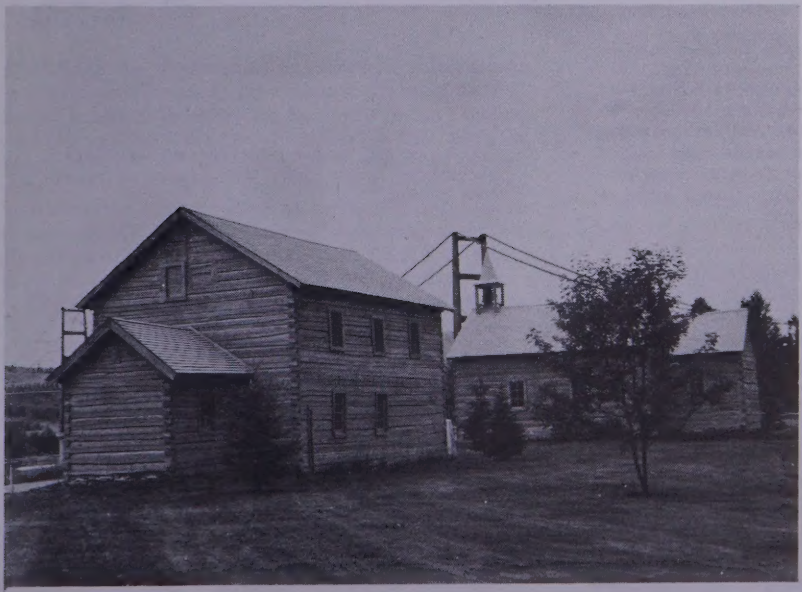
(See Also Front Cover)

DUNVEGAN: Once the subject of heavy real estate speculation, now a series of farms, market gardens and a historic site/camping area.

As it stands at present the historic site will not be physically affected by dam development since it lies downstream of the dam site and bridge. However, the development may affect any future plans to expand the site in the direction of the dam site, or any provincial park development involving the historic area and part of the Hines Creek basin.



From the road bridge



Main site buildings framed in support towers and cables of Dunvegan road bridge.

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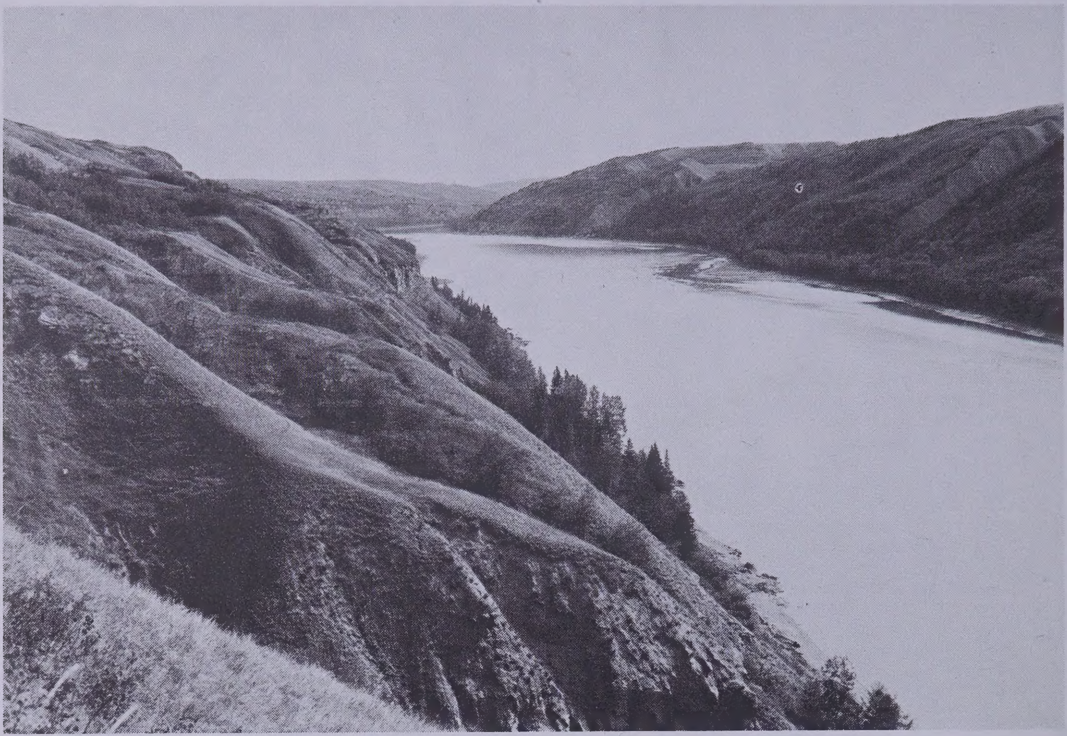
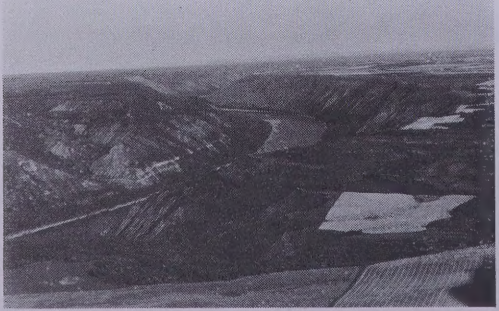


The Peace River valley just downstream from the B.C. border. A peaceful wilderness area. The northern valley side is well grazed and particularly susceptible to slumping. The southern valley side is well forested, but could be susceptible to slumping once the vegetation is cleared in advance of a reservoir.

The Peace River is deeply incised into the surrounding tableland, strongly limiting the reservoir extent to a slender area only slightly larger than the present river surface. In certain areas of the tableland, agriculture takes place right up to the valley edge, whereas in other areas there is virgin bush, some of which forms a part of a forest reserve.



A limited number of river valley flats or terraces occur along the stretch of river under study.

THE PROPOSED HYDRO DAM ON THE PEACE AT DUNVEGAN

The narrow valley of the Peace River just upstream from Dunvegan has regularly attracted interest as a possible dam site. Local people and their elected representatives have in some cases promoted such a dam in the expectation that a major benefit would lie in the creation of a possible trackbed for a railway linking Fairview and Rycroft. Today the possible dam development at Dunvegan is the subject of the most intensive and comprehensive set of feasibility and impact studies mounted to date. At the same time there is increasing interest on the part of local and regional residents in finding out about, and becoming involved in, the process of making a decision on the pros and cons of a hydro dam at Dunvegan. The project, if it were to go ahead, has the makings of being the most significant single resource development ever to take place in the whole Peace River Country. Depending on the outcome of the studies the development could well exceed the Bennett Dam development in terms of total costs of the project.

The latest round of interest dates from a decision made by the Provincial Government of Alberta in the summer of 1974, following a preliminary reappraisal of the possibility of building a hydro dam at Dunvegan. In an August news release Mr. Yurko, then Minister of the Environment, announced the initiation of studies into the engineering feasibility, economics, and various categories of impact (social, economic, archaeological-historical, environmental) of constructing a dam at Dunvegan. (See elsewhere in this issue for a full statement of this news release). The main purpose of the proposed dam would be to store water for the generation of hydro-electricity but other purposes have been identified in the areas of flood control, flow augmentation and the provision of water-based recreation facilities. The cost of the studies totalled $2.25 millions, with the engineering studies receiving the lion's share ($1.8 millions).

Following the Ministerial announcement the Peace River Regional Planning Commission immediately registered interest in becoming involved in the studies. Upon instructions from the Commission the Director wrote to Mr. Yurko requesting that residents of the region be involved in the studies in a meaningful way. In response the Commission was granted representation on a special Provincial Government Ad Hoc Committee monitoring the Dunvegan Dam Studies. The project leader, and Chairman of the Committee is Mr. 'Tuffi' Mussivand, Director of the Environmental Planning Division, Alberta Environment. Other members of the Committee are drawn from the departments of Environment, Culture, and Recreation, Parks and Wildlife. The Energy Resources Conservation Board is also represented. Mr. Ian Wight, Senior Research Planner is currently the Commission's representative on the Committee.

To assist Mr. Wight and to organize regional input to the issue the Commission has set up a special subcommittee, the Dunvegan Dam Review Committee. The Committee consists of Mr. Jim Reynolds (Town of Fairview) as chairman, Mr. Fred Horn (Town of Spirit River) as vice-chairman, Mr. Glenn Clegg (M. D. of Fairview), Mr. Willi Zahara (M.D. of Spirit River), Mrs. Flora Simmons (City of Grande Prairie) and Mr. John Hokanson (Town of Peace River). Mr. Wight serves as secretary and as the link with the Provincial Government Ad Hoc Committee.

The Review Committee meets about once a month and acts as an advisory body to the full Commission. At its first meeting in March 1975, the Committee developed a set of terms of reference and outlined a program of action. One of the terms of reference is to provide information to regional residents on the studies and on related or similar projects elsewhere. This paper is intended to fulfill, in part, this objective.

The Review Committee hopes to use additional means of communicating information on the issue to the regional public, such as films, slide-sound presentations, newspaper articles, and public meetings. The Committee is also encouraging the Fairview and District Chamber of Commerce to sponsor a major public forum on the issue sometime later this year.

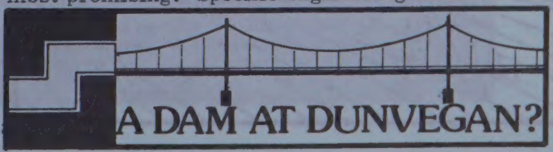
A HYDRO DAM AT DUNVEGAN

Historical Background

In spite of any rumours to the contrary no public decision has yet been made on whether or not to build a hydro dam on the Peace at Dunvegan. The dam is only a possibility at the present time. At the most it is a proposal which is currently being subjected to detailed and broad-ranging scrutiny through expensive government-sponsored studies. This study process is part of a broader decision-making process which will have to be worked through before a dam could become a reality or before the idea could be laid to rest until conditions are more appropriate. Up to this point in time several important decisions from a technical and political point of view have been made in connection with the decision-making process affecting the Dunvegan Dam proposal.

There is a long history of technical interest, dating back at least to 1916, in constructing a dam at Dunvegan for one purpose or the other. The most talked about purpose is to store water for hydro-power generation, although another purpose investigated recently was to store water for transportation, via canals, to more southerly located river basin systems.

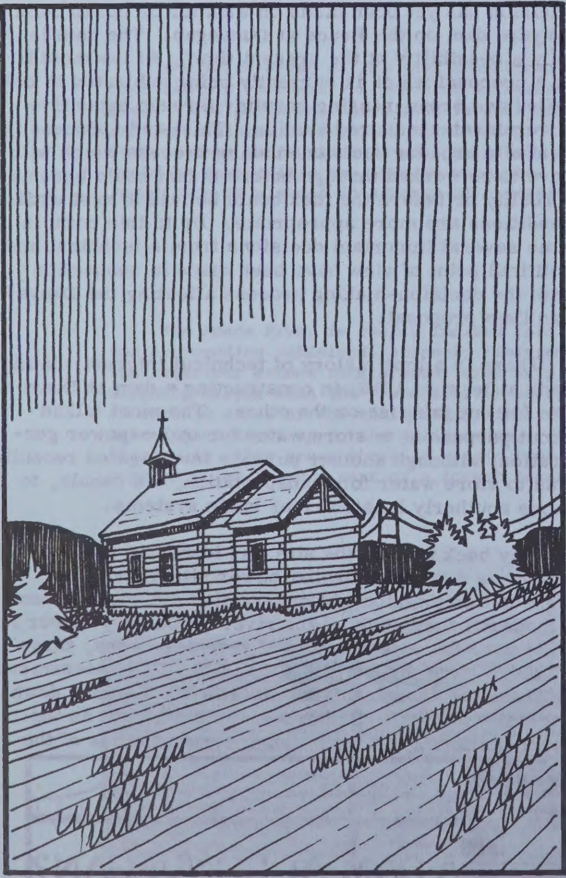
Way back in 1916 the site was identified among others as a potential hydro-power site by the then Canada Commission of Conservation. A more recent reconnaissance study of the river by Calgary Power in 1964 includes a description of seventeen sites, three of which were the subject of more detailed assessment. Of these the Dunvegan Site, at Mile 79 (distance downstream from the B.C. border was picked out as the most promising. Specific engineering studies of the

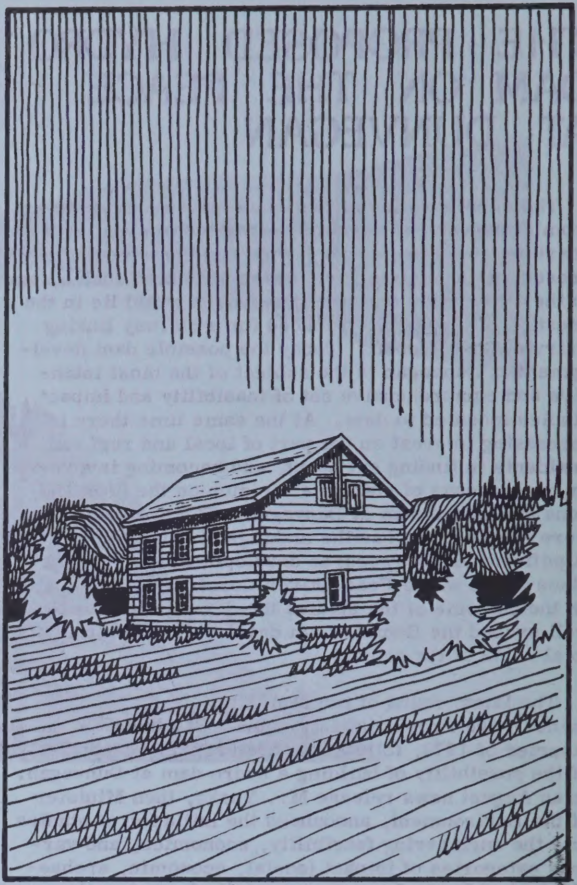

A DAM AT DUNVEGAN?

site followed in 1965 and Montreal Engineering Company Limited, in 1968, prepared a preliminary appraisal of the Dunvegan Hydro Site for Calgary Power.

Over the next few years interest in the main purpose of a dam at Dunvegan shifted from that of hydropower generation to interbasin water diversion purposes. The Saskatchewan-Nelson Basin Board undertook a major Prairie Provinces -wide study which was concerned with the engineering feasibility of transferring water from the richly supplied northern basins to southern populated areas where water supplies are less but user demand pressure is much greater. The Board's study looked into dams, at Dunvegan on the Peace and at Goodwin on the Smoky, to store water, some of which could then be transported overland, via canals, to more southerly located river basins. The study's recommendations have been shelved at the present time but the study did add further engineering data concerning a dam at Dunvegan.

Interest in a Dunvegan Dam for mainly hydropower purposes again came to the fore in 1973 with the publication, by the Alberta Energy Resources Conservation Board, of "The Hydro and Hydro Electric Energy Potential of Alberta: A Preliminary Appraisal". In this report the Dunvegan Site was identified as one of about six sites in the Province meriting serious further research and consideration for development. That report also noted that further development of Alberta's hydro energy potential was not expected for the next five to fifteen years because lower cost electric energy may now be generated from fossil fuels. Despite this perspective, interest in a Dunvegan hydro dam was heightened by the possibility of achieving other benefits from building a dam in addition to hydro-power. At about this time B.C. parties were showing strong interest in rapidly developing all the remaining hydropotential of the Peace River in B.C. to maximise the hydro-power generation benefits conferred on the river by completion of the massive W.A.C. Bennett Dam and Williston Reservoir. This feature in itself enhanced the attractiveness to Albertans of building hydro dams on the Alberta stretch of the Peace and Slave Rivers.





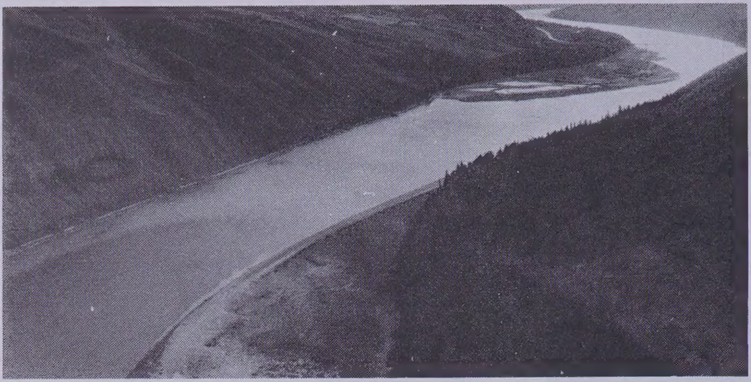
By building one dam at Dunvegan it is possible to do away with the need to build at least one other dam (and possibly two other dams) on the B.C. stretch of the Peace River, and still obtain the same total amount of power. Considerable capital cost savings to both governments might be achieved through a joint venture. It was to thoroughly investigate these possibilities that Mr. Yurko, then Minister of Alberta Environment, in August 1975, announced the initiation of the Dunvegan Dam feasibility and impact studies.

The Ksituan River near its confluence with the Peace. Several coulees like this constitute important habitat for wildlife. The coulees are also the scene of particularly active slumping in many places; they are also well forested in many cases and their steep slopes could create difficulties in the business of tree clearing in advance of a reservoir.

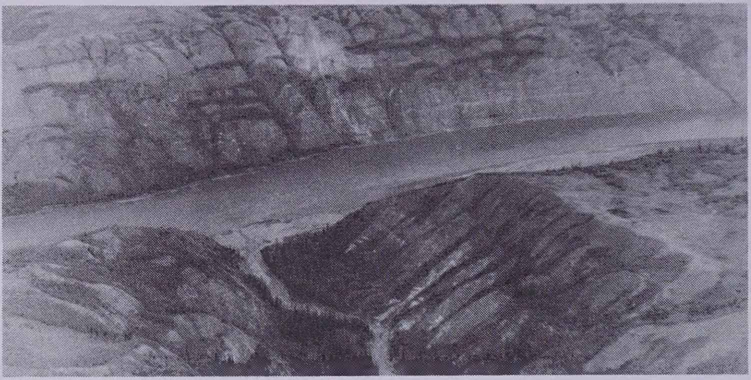
Groups of islands are dotted along the extent of the river under study. The islands are used by waterfowl and also by recreationists. Most of the islands would be totally flooded by even a low head dam.

The confluence of the Clear River and the Peace River looking north. With a medium head dam, the Clear River's valley would be flooded to a distance of about 6 miles back from the Peace River; with a high head dam the distance would be about 16 miles.

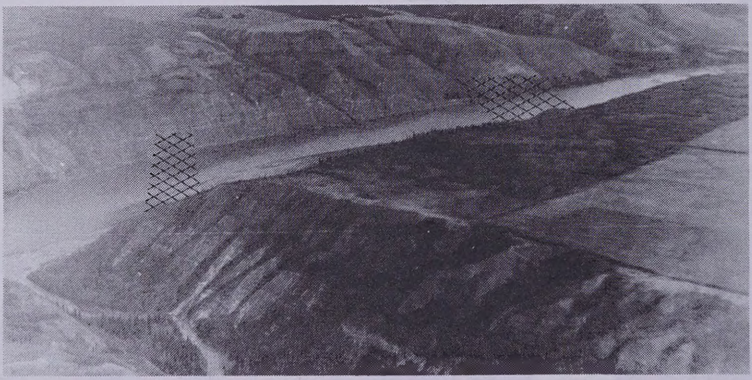
The river supports many types of waterfowl using the river surface and other birdlife using the steep slopes.



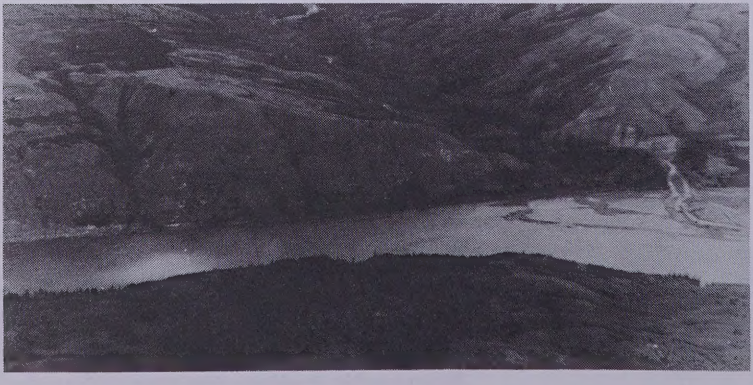
View of dam site area - looking downstream towards Dunvegan Bridge. Possible concrete dam type site in immediate foreground; possible earthfill dam type site in centre of photograph. Just beyond this is the delta at the mouth of Hines Creek, and beyond this the bridge and historic site.



Closeup of possible concrete type dam site; Ksituan river in centre foreground.



View of possible dam site area under investigation, looking north. Concrete dam type possibility to left; earthfill dams type possibility to right.



Closeup of possible earthfill type dam site; Hines Creek in upper right background.

CONSULTANTS TERMS OF REFERENCES

Feasibility and impact studies are being undertaken to cover all aspects of the proposed development. These studies, which are scheduled to be completed by November, 1976, will endeavour to answer the following questions.

Archaeology

1. What archaeological and historical information is already available for the study area?
2. What historical, anthropological, and archaeological sites would be of potential interest to the public, with regard to the project?
3. Where are these sites located?
4. What is the impact of the potential reservoir and dam on these sites?
5. What possible measures could be taken to overcome any negative impacts?
6. Should these sites be developed for public appreciation?

Economics

1. What would be the present and future uses for water impounded in the potential reservoir (i.e. hydroelectric, municipal developments, fish and wildlife, agriculture, recreation, industry, water quality, flood control, etc.)?
2. What would be the economic impact of the potential project?
3. What would be the economic benefits of constructing the proposed dam and of the resulting river flow modification?
4. What would be the costs of constructing the proposed dam?
5. How would the establishment of power generation facilities affect the economy?

Engineering

1. Can a dam be built in the study area?
2. Of what type, height, and design would this dam be?
3. Exactly where would this dam be located?
4. What is the storage capacity and area covered by the proposed reservoir?
5. What would be the expected downstream flows, if the proposed dam is constructed?
6. What is the power potential of the project?
7. What would the proposed dam, powerhouse, and reservoir cost (i.e. land clearing, river diversion works during construction stages, embankments, structures, reservoir damages, contingencies, engineering, interest during construction)?
8. How would the project be operated and maintained?
9. What would be the effects on river conditions upstream and downstream?
10. What land purchase and property damage costs would this project entail?
11. Would the proposed dam have any potential for flood control?
12. Does the study area have suitable building materials for the construction of the proposed dam?
13. Would there be any ice flow problems if the proposed dam is constructed?
14. What would be the "energy cost" for each proposed dam alternative?

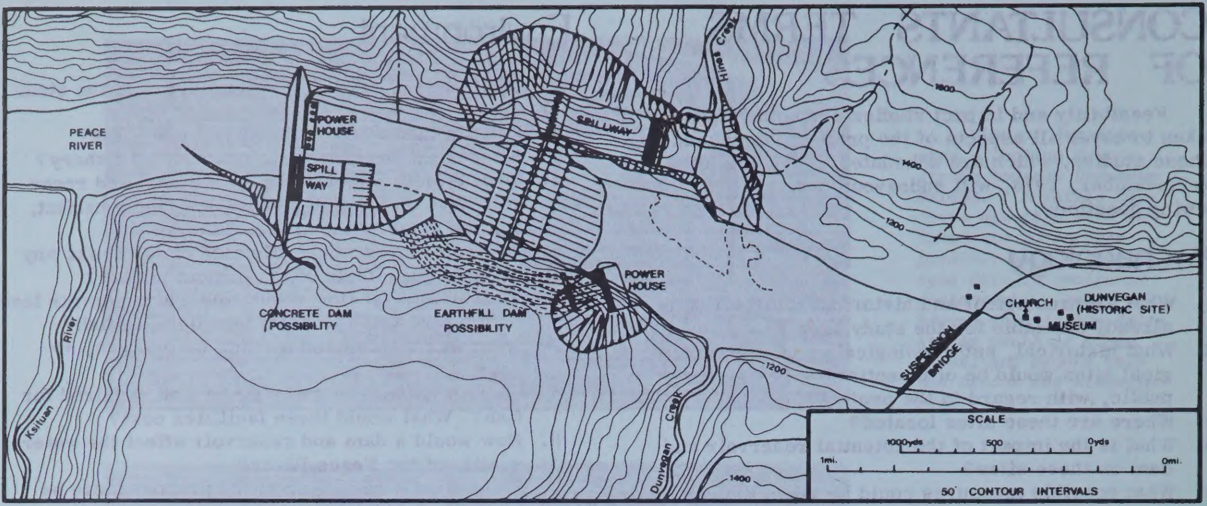
Environment

1. What are the existing fish resources of the study area?
2. What is the present fish environment like?
3. What is the present value of the sport fishery?
4. What effects would the proposed dam and reservoir have on the fish populations, their habitat, and the value of the sports fishery?
5. What measures would alleviate or minimize any detrimental effects of the project on fish?
6. What pattern of flow regulation and reservoir level fluctuation would be most beneficial to fish?
7. What will the demand for fish be in 5, 10, 30 years?
8. Would bypasses or passageways be required for fish? What would these facilities cost?
9. How would a dam and reservoir affect the water quality of the Peace River?
10. How would a reservoir at the proposed site be best regulated to maintain good water quality, both in the reservoir and the river?
11. What are the existing wildlife resources in the study area?
12. What is the distribution of these ungulates, furbearers, waterfowl, and upland game birds?
13. How is the vegetation of the area classified?
14. What are the food and cover requirements of key wildlife species?
15. What are the ecological or geographic subdivisions of the area according to relative importance for wildlife production and utilization?
16. What is the estimated capability of the proposed reservoir for waterfowl production?
17. What are the long-term effects of the dam on waterfowl capability, ungulates, furbearers and other mammals, and the vegetation pattern?
18. What is the pattern of flow regulation and reservoir level fluctuation most desirable for the benefit of wildlife?
19. What benefits would this project provide for wildlife?
20. How could this project be best operated to minimize wildlife resource damage?
21. What is the natural river regime in the study area: origin of sediment, nature of riverbed material, quantity and composition of transported sediment?
22. What would be the potential extent and rate of sedimentation in the proposed reservoir?
23. What would be the potential degradation of the river channel downstream from the proposed dam?

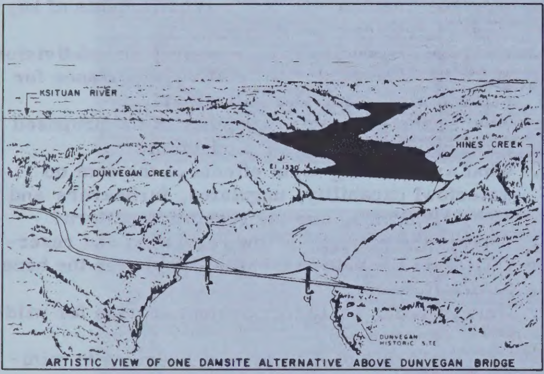
Recreation

1. What are the types and amount of recreation which now occur in the study area?
2. What opportunities currently exist for recreation development along the river?
3. Would additional opportunities for recreation be provided by the proposed dam and reservoir?
4. Would existing recreation opportunities be decreased by the proposed dam and reservoir?
5. Are additional flows required to enhance recreation opportunities along the river?
6. What would be the future demand for recreation if the proposed dam and reservoir are constructed? How much of this demand could be met?
7. What effects would reservoir level fluctuation have on potential for water-based recreation?

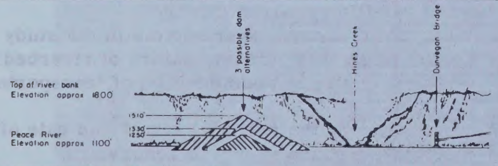
(continued - inside back cover)



Schematic Layouts to Illustrate Possible Dam Types and Locations *



ARTISTIC VIEW OF ONE DAMSITE ALTERNATIVE ABOVE DUNVEGAN BRIDGE


Top of river bank Elevation approx 1800'
Peace River Elevation approx 1100'
1510'
1330
1250
3 possible dam alternatives
Hines Creek
Dunvegan Bridge

SIDE VIEW OF POSSIBLE DAM SITE

N.B. The artistic view is presented simply to illustrate the nature of the reservoir that may be anticipated behind the dam and the dam level alternatives being studied, relative to the top of the river valley sides. The dam structure blocked in corresponds approximately to the medium head dam level; it resembles a possible concrete dam type, and is located on the approximate earthfill dam site.

**to simplify things the illustrations are drawn for the medium-head dam height alternative only. Illustrations for the high-head and low-head dams would be proportionately larger or smaller respectively.*

ENGINEERING ISSUES AND STUDY ALTERNATIVES

In simple terms the engineering studies are intended to address some basic questions, such as:

Can a dam be safely built at the damsite investigation area?; Where exactly might it be built?; What type of dam is practical?; What height of dam is practical?; What would it all cost?; What are the upstream and downstream effects?; What other purposes, in addition to hydro power generation, might the dam conveniently serve? How much energy could be obtained? How reasonable is the cost of obtaining this energy in relation to other energy sources or developments?

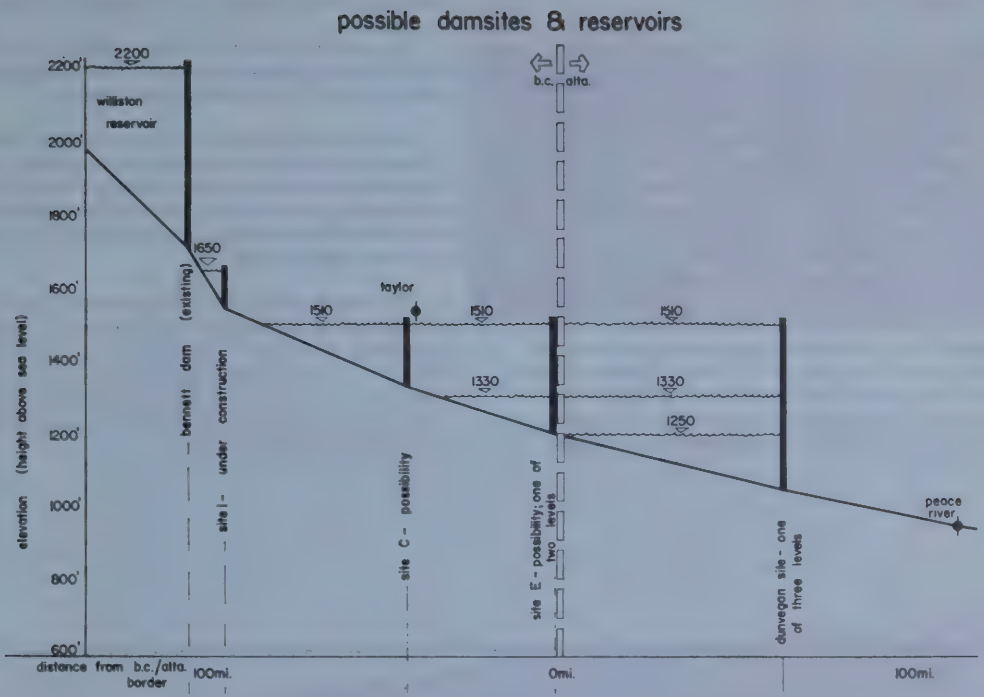
What sort of alternatives are being considered in the engineering studies? In terms of height, in view of a possible joint development of the Dunvegan Dam Site by both Alberta and British Columbia, the studies are to include dam heights for each of the following three full supply levels (F.S.L. - given as feet above mean sea level, a.m.s.l.).

1. F.S.L. 1250 - limited by the Alberta-B.C. boundary, and coinciding with the tailwater elevation of B.C. Hydro's possible Site E.

2. F.S.L. 1330 - limited by the highway and railway bridge over the Peace River at Taylor Flats, B.C. This F.S.L. would coincide with the tailwater elevation of B.C. Hydro's possible Site C.

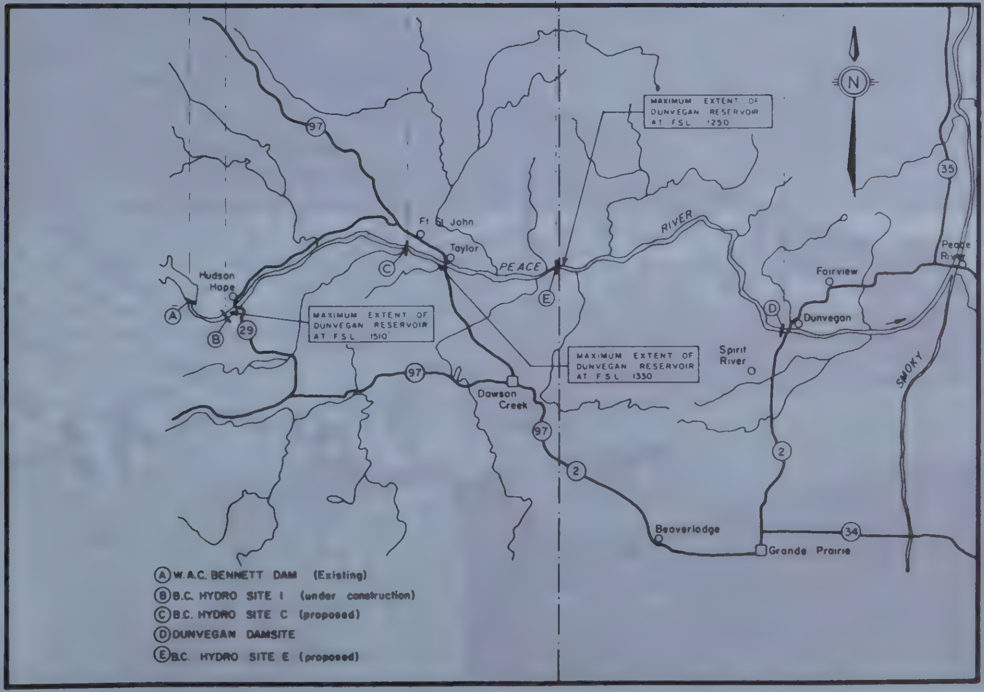
3. F.S.L. 1510 - limited by the tailwater level of B.C. Hydro's Site One dam, which is now under construction.

Regarding dam types and precise dam sites the studies include an investigation of the possibility of



Profile of the Peace River

General Location Plan


MAXIMUM EXTENT OF DUNVEGAN RESERVOIR AT F.S.L. 1250
MAXIMUM EXTENT OF DUNVEGAN RESERVOIR AT F.S.L. 1510'
MAXIMUM EXTENT OF DUNVEGAN RESERVOIR AT F.S.L. 1330
N
97
35
Ft St John
Taylor
PEACE
RIVER
Hudson Hope
Peace River
Fairview
Dunvegan
Spirit River
Dawson Creek
Beaverlodge
Grande Prairie
SMOKY
29
97
97
2
2
34
A
B
C
D
E
Ⓐ W.A.C. BENNETT DAM (Existing)
Ⓑ B.C. HYDRO SITE I (under construction)
Ⓒ B.C. HYDRO SITE C (proposed)
Ⓓ DUNVEGAN DAMSITE
Ⓔ B.C. HYDRO SITE E (proposed)

an earth fill dam at a site about 6600 (2000 m.) feet upstream from the Dunvegan bridge, or a concrete construction dam about 11,000 feet (3300 m.) upstream from the bridge.

An earthfill dam is a much more massive project to contemplate compared with a concrete dam. The construction of the tunnels and particularly the spillway associated with the earth fill dam type involves the prospect of a considerable amount of excavation. In addition, construction of the embankment would entail the movement of a very large volume of material for the Dunvegan Dam Site investigation area.

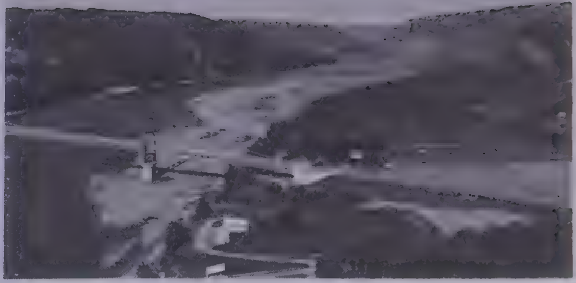
A concrete dam brings the prospect of being considerably cheaper than the earthfill alternative, in part because it would enable the placing of a spillway diversion and powerhouse as part of the dam. Also less excavation would be required and the dam would have more modest dimensions. A major problem with the concrete alternative however is the stricter requirements from a geological point of view. There must be no question that the surrounding geological strata can form a safe anchor for the dam. The studies are attempting to determine if the rock in the dam site area is suitable for a concrete structure since some doubt exists at the present time.

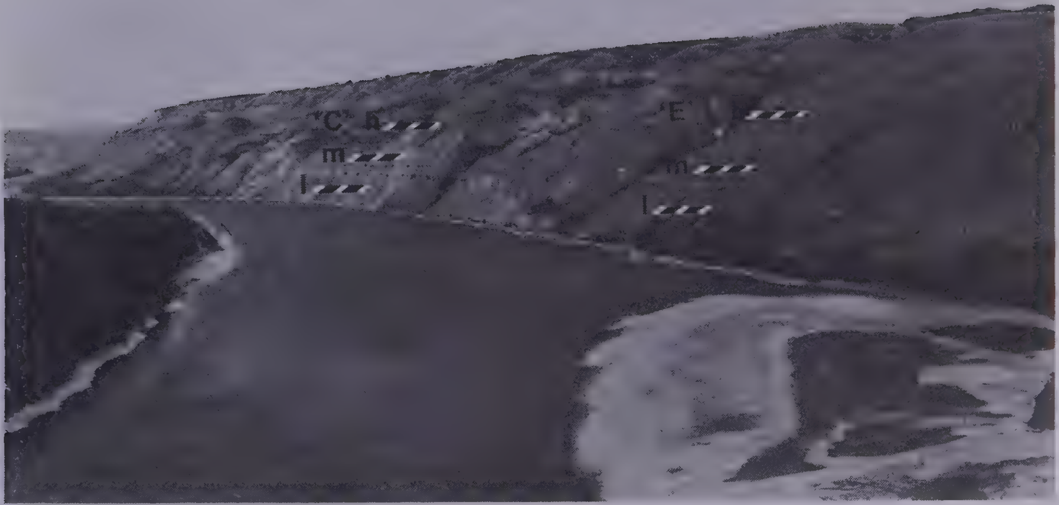
The alternatives as to dam height, type and site are displayed diagrammatically and pictorially in other parts of this information report.

Some points that might be stressed is that the resulting reservoir at a Dunvegan Dam Site, even if a high head dam were built, would be well confined to the existing river valley and tributary valleys. There would be no flooding of any tableland above the top of the river valley edge.

The fact that any dam structure would be well below the top of the bank might adversely affect the feasibility of using the dam top as a trackbed for a railway. Considerable excavation of grades would be required, especially in the case of a possible concrete dam at the site currently being investigated for that type of dam.

Possible dam site area looking west. Dunvegan historic site at bottom centre. Hines Creek enters the Peace River at centre right.





Dam site area looking northwest. Approximate levels of three alternative dam heads (Low, Medium, High) are shown for both the concrete (left set) (C) and earthfill (right set) alternative dam types (E).

Dam site area framed in girders of Dunvegan road bridge.

Only one regularly occupied dwelling would be flooded by the reservoir resulting from a possible dam. A few recreational buildings would also be inundated.

Slumping, at all scales, is a current feature of the sides of the rivers and coulees.

Large scale earth slump hollow on north side of the Peace River. Slumping may be encouraged further by the presence of a reservoir.

HYDRO-DEVELOPMENT OF THE PEACE RIVER IN BRITISH COLUMBIA

Introduction:

The residents of the Lower Peace River area in B.C. have experienced the effects of hydrodevelopment in the region, in the past in connection with the construction of the W.A.C. Bennett Dam at Portage Mountain, and presently with construction of the Site One dam, 14 miles downstream from Bennett. The adverse Bennett Dam experiences prompted a different approach by B.C. Hydro to the Site One development. Environmental and socio-economic studies were commissioned and a series of public meetings held.

The Site One development is much more modest in scale compared to Bennett, and may well also be smaller than the eventual development at Dunvegan, if a dam were to be built there. Some information on these two existing developments on the B.C. Peace may be gleaned from the photographs and diagrams presented elsewhere in this information report.

There are two other sites of interest for hydrodevelopment on the B.C. Peace, Site C south of Fort St. John, and Site E, between the Clayhurst Ferry and the Alberta border. B.C. Hydro recently issued a statement on the status of these sites. The statement is reproduced here. Refer to the maps and diagrams for further information.

Statement on the Status of Sites C and E on the Peace River

(A report from Public and Customer Relations Division, B.C. Hydro, Vancouver)

Residents of communities on the Lower Peace River have probably been aware that researchers and consultants under contract to B.C. Hydro have been quietly looking over the area between Hudson Hope and the Alberta border during the past few weeks.

This is in spite of the fact that a Hydro task force, in recommending potential power sites for development during the next 15 years, did not include the Lower Peace on the list.

So there is bound to be some curiosity over Hydro's present activity.

No Projects Planned

First - be reassured there's nothing in the wind for the near future.

But Hydro has to look many years ahead as it plans to provide adequate power to meet the growing needs of British Columbia. And for hydroelectric energy, it follows the policy of looking first at the remaining potential of rivers which have already been harnessed.

The Peace is such a river, with the W.A.C. Bennett Dam completed and producing power, and Site One under construction.

Power planners feel they have mapped guidelines to meet the requirements to 1990, but these are subject to review and, as well, other studies will be necessary to make decisions for the years beyond. So the Lower Peace naturally bears looking at.

In the 85 miles between Site One and the Alberta border, the Peace falls 260 feet, a drop sufficient to produce about 1,850 megawatts of power if it were dammed and fed to turbines.

Preliminary engineering studies have indicated two sites on the river in British Columbia are suitable for constructing dams.

Site C

The first, about two miles upstream from the Moberly River, has been named Site C for identification, and is 155 feet lower in elevation than the outlet of Site One.

A 155-foot-high dam here would create a slender reservoir extending back almost to Site One. For the greater part of the distance it would be little wider than the present river, but some flooding would occur at Halfway River and for a few miles above and below Bear Flat.

The reservoir would extend about five miles up the Halfway River, and would make it just over a mile wide where it empties into the Peace.

Cache Creek, which joins the Peace at Bear Flat, would be flooded but slightly.

Highway 29 would have to be relocated at Halfway River and for a few miles upstream from Bear Flat, and several small islands just upstream from Site C and near Bear Flat would probably disappear.

Site E

The second location suitable for a power dam is called Site E, between the Clayhurst Ferry and the Alberta border, at which point the river has fallen another 105 feet from Site C.

The engineers see two possibilities here.

One would be to build a low dam about 105 feet high, to create a reservoir back to the foot of the Site C dam, which like the Site C reservoir, would not be a great deal wider than the present river.

The second possibility is to build a 260-foot dam at Site E, without a dam at Site C, and using the full fall of the river from Site One to Site E to power a single, larger generating plant.

The reservoir created by a 260-foot dam at Site E would be the same between Site One and Site C as with a Site C dam, but would be considerably wider from Site C to Site E than with a low dam at Site E.

Most serious flooding would occur near Taylor, where the Alaska Highway and the British Columbia Railway cross the Peace.

Five tributary rivers, Moberly, Pine, Beatton, Kiskatinaw and Alces would be raised and widened for distances of up to 25 miles back from their junctions with the Peace.

Some valuable bottomland, and some with potential value in the future would be flooded, and some residents would be forced to move.

Engineers and economists are studying the two proposals to compare practicability and costs.

Impact Studies

But Hydro must also have the best information obtainable concerning the impact of both proposals on the environment, and on the social and economic life of all residents in the area to weigh advantages against disadvantages.

The studies will in addition provide input to the joint investigations under the auspices of the Alberta and B.C. governments for alternative developments of the Peace River downstream of Site One including possible developments at Site C, Site E, and Dunvegan, a downstream site in Alberta.

In August 1974, a consulting team headed by Thurber Consultants, and comprising Renewable Resources (fish and wildlife), Reid, Collins and Associates (forestry), Land Use Services (recreation) and Canadian Bio Resources (agriculture), were engaged to undertake environmental studies of the area. A socio-economic consulting group, Canadian Resourcecon, Hancy and Veit, have recently been added to the Thurber team.

The socio-economic consultants will study the probable impacts on all the communities liable to feel the influence of a power project - both during construction and into the future. They will recommend methods of mitigating and compensating for adverse effects.

Much background information is available from the latest Canadian Census, but for greater detail the researchers will visit and interview as many residents as possible.

Later they plan to hold public information meetings for an exchange of opinions with the residents.

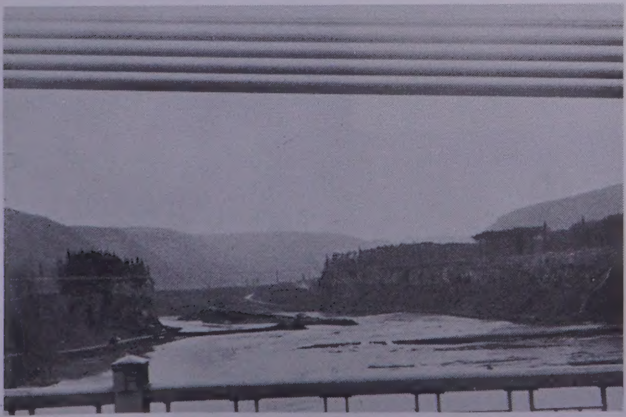
For in studying projects of this nature, Hydro feels all interests should be considered.

SITE ONE DEVELOPMENT (near Hudson Hope, B.C. Peace)
Artist's sketch of dam, now under construction. It will be a concrete dam, about 150 feet high, and is expected to cost between $400 millions and $500 millions. It is located about 14 miles downstream from the Bennett Dam.

The Commission's Dunvegan Dam Review Committee:

From left to right; Mr. Willie Zahara (M.D. of Spirit River); Mrs. Flora Simmons (City of Grande Prairie); Mr. Fred Horn, Vice-Chairman (Town of Spirit River); Mr. Glen Clegg (M.D. of Fairview); Mr. Jim Reynolds, Chairman (Town of Fairview). Absent when the photograph was taken was Mr. John Hokanson (Town of Peace River).

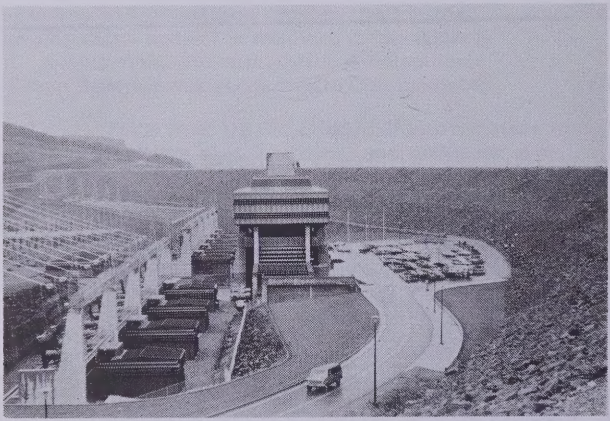
A close-up shot of some of the mobile home lots in the vicinity of Hudson Hope, vacated after the last boom (Bennett Dam), awaiting the next boom (Site One).



A view of the Site One development taken from the bridge over the Hudson's Hope - Chetwynd highway on a rainy day in August, 1975. Land clearing in preparation for construction is well advanced with the Coffer Dam and Diversion Tunnels apparently in place.

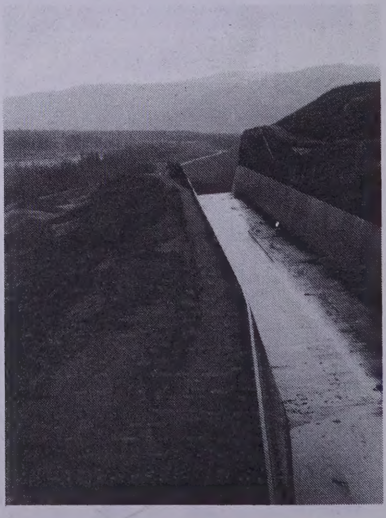
A view of the Bennett Dam looking towards the generating station and the outlet tunnels. Therim of the spillway may just be distinguished in the bottom foreground.

The Bennett Dam, generating station and switchyards; the whole project has been priced at over $800 millions. It is an earthfill type of dam, over 600 feet in height.



BENNETT DAM: B.C. PEACE

The major hydro development on the Peace River to date, acting as a strong incentive for further downstream hydrodevelopment.



The spillway, an expensive feature in the case of earthfill type dams, but very necessary to take care of extreme flood level situations.

The photo of the dam (top right of this page), was taken from the observation area at the upper left.

Consultants Terms of References (continued)

8. How should recreation development be carried out at the proposed reservoir and along the river?

Sociology

1. How would community patterns, traditions, and functions be affected by the proposed development?
2. Would any relocation of people be required?
3. What increased work opportunities would the project provide for people in the area?
4. Where would workers live during and after construction of the proposed project? How would this affect the people in the area?
5. What changes would occur in the economy and population of the area?
6. Would any inconvenience to the area residents be created by the proposed development?

Dunvegan Dam Studies

Editorial Note:

There follows a reprint of the initial news release issued by the Minister of the Environment, Honourable W. J. Yurko, on August 14, 1974.

The province has approved detailed studies on the feasibility of a dam near Dunvegan on the Peace River for the purpose of generating hydroelectric power, W.J. Yurko, Minister of the Environment, announced today.

A special warrant of $750,000 has been approved by cabinet to meet the costs during the current fiscal year of the 18-month study.

The total cost of the study is estimated at $2.25 million with the engineering and design aspect expected to cost $1.8 million.

The remaining $450,000 will be spent on assessing the social, economic, environmental and archeological impacts of such a dam.

The environmental assessment will include such factors as downstream affects, flood control and effects on fish and wildlife.

All of the studies are to be directed by the Department of the Environment and are expected to be completed during the early part of 1976.

Preliminary studies into the dam were made by the government, Calgary Power Ltd. and Canadian Utilities Ltd. in 1965, and more recently during a study of the Saskatchewan-Nelson River Basin.

The department of the Environment has engaged Calgary Power to do the engineering and design studies on a direct cost basis. Calgary Power was selected because of its extensive past experience with hydroelectric projects in Alberta.

Submissions will be called for the environmental, archeological, sociological and economic aspects of the study.

Depending on the height of a dam at the site, just upstream of the Dunvegan bridge, power generation could be about 500,000 kilowatts.

A high dam would back water up into British Columbia and flood a site that province has identified as having hydroelectric potential.

Discussions now are proceeding with British Columbia to assess the merits of constructing a single dam at Dunvegan, rather than two dams at separate sites.

In announcing the studies, Mr. Yurko emphasised that while the feasibility of a dam at Dunvegan is being studied, a decision on the merits of a dam at this site will not be made until mid 1976 when all of the studies are completed.

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